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27 DEC 2004

PCT/DE2003/002047



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference V51051WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/002047	International filing date (day/month/year) 18 June 2003 (18.06.2003)	Priority date (day/month/year) 25 June 2002 (25.06.2002)
International Patent Classification (IPC) or national classification and IPC B22D 19/00		
Applicant MAHLE GMBH		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>1</u> sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 23 January 2004 (23.01.2004)	Date of completion of this report 28 July 2004 (28.07.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE2003/002047

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-5, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the claims:

pages 1, 2, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages 3, filed with the letter of 22 June 2004 (22.06.2004)

☒ the drawings:

pages 1/1, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-3	YES
	Claims		NO
Inventive step (IS)	Claims	1-3	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-3	YES
	Claims		NO

2. Citations and explanations

1. Reference is made to the following documents:

- D1: FR-A-2 044 242 (ASS ENG LTD) 19 February 1971
(1971-02-19)
- D2: GB-A-1 229 346 (N.N.) 21 April 1971 (1971-04-21)
- D3: DD 143 563 A (BUECHNER LUTZ; RASCH KARL; THALER
WILFRIED) 3 September 1980 (1980-09-03)
- D4: DE 26 24 412 A (ALCAN ALUMINIUMWERKE)
15 December 1977 (1977-12-15)
- D5: DE 101 34 293 A (MAHLE GMBH) 6 March 2003
(2003-03-06)
- D6: DE 197 01 085 A (KOLBENSCHMIDT AG) 16 July 1998
(1998-07-16)
- D7: US-A-3 963 818 (SAKODA TADAMI ET AL) 15 June
1976 (1976-06-15)

1. Novelty and inventive step (PCT Article 33)

According to independent claim 1, granulated salt is compressed to form a salt core in the turned groove of a ring carrier, the ring carrier and salt core are preheated and the two are immersed in an alfin bath.

D1, which is considered the prior art closest to this claim, states that a suitable material, which is soluble after casting, is poured into the annular groove. D1 does not state that this is a salt core, leaving the question of pretreatment of the ring carrier open.

According to independent claim 3, a pre-compressed salt core is stuck in the turned groove of a ring carrier, the ring carrier and salt core are preheated and the two are immersed in an alfin bath.

D2, which is considered the prior art closest to this claim, states that a suitable salt core, which is soluble after casting, is secured in the annular groove in an already pretreated ring carrier. D2 does not state that the salt core is stuck in, leaving the question of the pretreatment of the ring carrier open.

Therefore the subject matter of independent claims 1 and 3 meets the requirement of PCT Article 33(3).

The use of salt cores for cavities in pistons is known from the prior art (D3). According to D6, the ring carrier is alfinied together with the salt core (D6); however, that document concerns a clamping/retaining construction.

However, the cited documents do not describe or suggest preparing the salt core by pressing granulated salt into a turned groove in the ring carrier.

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Similarly, they do not describe or suggest immersing in an alfin bath the ring carrier together with the a salt core stuck in a turned groove. Thus the problem of avoiding the disadvantages described with respect to the D1 method (cavities between the wall and core, bonding between the ring carrier and piston) is solved.

Consequently the subject matter of independent claims 1 and 3 meets the requirements of PCT Article 33.

Claim 2 is dependent on claim 1 and hence likewise meets the requirements of PCT Article 33.

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